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MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER

GREENE, JASON M

ART UNIT	PAPER NUMBER
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1724

DATE MAILED: 05/29/2003

164

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/871,582

Applicant(s)

BARRIS ET AL.

Examiner

Jason M. Greene

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-149 is/are pending in the application.
- 4a) Of the above claim(s) 139 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-8, 20, 37, 48-53, 81, 111, 128, 132 and 146 is/are rejected.
- 7) ☐ Claim(s) 9-19, 21-36, 38-47, 54-80, 82-110, 112-127, 129-131, 133-138, 140-145 and 147-149 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Response to Arguments

1. Applicant's arguments with respect to claims 1-8, 20, 37, and 48-52 have been considered but are moot in view of the new ground(s) of rejection.

Claims

2. With regard to claim 1, the Examiner suggests Applicants rewrite the word "μ" at the end of line 6 as "μm" to correct an apparent typographical error.
3. With regard to claim 53, the Examiner suggests Applicants rewrite the word "μ" in line 10 as "μm" to correct an apparent typographical error.
4. With regard to claim 81, the Examiner suggests Applicants rewrite the word "μ" in line 9 as "μm" to correct an apparent typographical error.
5. With regard to claim 111, the Examiner suggests Applicants rewrite the word "μ" in line 8 as "μm" to correct an apparent typographical error.

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6. With regard to claim 128, the Examiner suggests Applicants rewrite the word "μ" in line 6 as "μm" to correct an apparent typographical error.

7. With regard to claim 132, the Examiner suggests Applicants rewrite the word "μ" in line 6 as "μm" to correct an apparent typographical error.

8. With regard to claim 146, the Examiner suggests Applicants rewrite the word "μ" in line 6 as "μm" to correct an apparent typographical error.

9. With regard to claim 1, the Examiner notes that the phrases "said first end" and "said second end" have been interpreted to mean the first and second axial ends of the substrate, respectively.

10. With regard to claim 14, the Examiner suggests Applicants insert the word "is" between the words "additive" and "miscible" in line 4 to improve the readability of the claim language.

11. With regard to claim 15, the Examiner suggests Applicants insert the word "is" between the words "additive" and "miscible" in line 5 to improve the readability of the claim language.

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12. With regard to claim 16, the Examiner suggests Applicants insert the word "is" between the words "additive" and "miscible" in line 3 to improve the readability of the claim language.

13. With regard to claims 48 and 49, the phrase "said seal" in line 1 has been interpreted as meaning the sealing portion.

14. With regard to claim 66, the Examiner notes that the claim depends from claim 46. However, it appears as though Applicant may have intended for claim 66 to depend from claim 53. For examination purposes, the Examiner has assumed claim 66 to be dependent from claim 46 since that is how the claim is written.

Claim Objections

15. Claim 11 is objected to under 37 CFR 1.75(b), as being a duplicate of claim 9. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper form.

Claim 11 recites the filter element of claim 1 wherein the polymeric fine fiber is formed from polyvinyl alcohol, wherein the polyvinyl alcohol is crosslinked with about 1 to 40 weight percent of a crosslinking agent. However, claim 9 also recites the filter element of claim 1 wherein the fine fiber is formed from polyvinyl alcohol, wherein the

polyvinyl alcohol is crosslinked with about 1 to 40 weight percent of a crosslinking agent.

Claim Rejections - 35 USC § 112

16. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

17. Claims 1, 53, 81, 111, 128, 132, and 146 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

18. The term "high efficiency" in claims 1, 53, 81, 111, 128, 132, and 146 is a relative term which renders the claims indefinite. The term "high efficiency" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The indefinite term renders the claimed efficiency of the substrate indefinite.

While the instant disclosure does not explicitly teach what is meant by the phrase "high efficiency", the specification discloses several examples of the inventive filter media wherein the substrate has an efficiency of between 3 and 55 percent in pages 68-70. Therefore, it appears as though Applicants intended the term "high efficiency" to

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mean that the substrate has an efficiency of at least 3 percent. However, in the reply filed 24 February 2003, Applicants argued that the substrate layer taught by Kahlbaugh et al. '399 does not possess substantial filtration efficiency. Since the substrate layer of Kahlbaugh et al. '399 is disclosed as having a filtration efficiency of 10 percent in col. 14, line 63 to col. 15, line 6, it is not clear if Applicants intended the phrase "high efficiency" to mean that the substrate has an efficiency of at least 3 percent or that the substrate has an efficiency greater than 10 percent. Therefore, the intended meaning of the phrase "high efficiency" is not clear.

Claim Rejections - 35 USC § 102

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. Claims 1, 2, 20, and 48 are rejected under 35 U.S.C. 102(b) based upon a public use or sale of the invention.

Under 35 U.S.C. §102(b), "[a] person shall be entitled to a patent unless ...the invention was in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States" 35 U.S.C. §102(b) (2000).

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Whether a patent is invalid for a public use or sale is a question of law based on underlying facts. A conclusion that a section 102(b) bar precludes a patent application from issuing must be based on substantial evidence. Section 102(b) may bar patentability by anticipation if the device used in public includes every limitation of the later claimed invention, or by obviousness if the differences between the claimed invention and the device used would have been obvious to one of ordinary skill in the art.

Public use includes any use of [the claimed] invention by a person other than the inventor who is under no limitation, restriction or obligation of secrecy to the inventor. The public use bar serves the policies of the patent system, for it encourages prompt filing of patent applications after inventions have been completed and publicly used, and sets an outer limit to the term of exclusivity. *Allied Colloids v. Am. Cyanamid Co.*, 64 F.3d 1570, 1574, 35 USPQ2d 1840, 1842 (Fed. Cir. 1995).

In this case, there is evidence that the invention was "completed" before the P19-1280 and P19-1281 filters were shipped to assignee's customers in the late spring of 1999, i.e., Solar Turbines, GE Elwood, GE Belle River, and the customers in Saudi Arabia and Santiago, Chile. Specifically, the production run noted at paragraph 10 of the Supplemental Crofoot declaration evidences that the filters were "completed" prior to their shipment to the customers.

Testing of a new product under development at the potential customer's site does not raise a public use bar as a matter of law. All of the circumstances must be considered, to ascertain whether on the entirety of the evidence it has been proved that the invention was publicly used.

The law recognizes that an inventor may test his invention in public without incurring the public use bar. Experimental use negates public use; when proved, it may show that particular acts, even if apparently public in a colloquial sense, do not constitute a public use within the meaning of section 102. TP Labs., Inc. v. Prof'l Positioners, Inc., 724 F.2d 965, 220 USPQ 577 (Fed. Cir. 1984)). "The use of an invention by the inventor himself, or of any other person under his direction, by way of experiment, and in order to bring the invention to perfection, has never been regarded as such a use." City of Elizabeth v. Am. Nicholson Pavement Co., 97 U.S. 126, 134 (1877). In this case, there is no evidence that the various customers to whom the filters were shipped in the spring of 1999 were acting under the direction of the inventors. They were not even aware that a so-called experiment was underway. See the Supplemental Crofoot Declaration at paragraph 17. There is no evidence of any oral or written confidentiality agreement between assignee and each of GE Belle River, GE Elwood, Solar Turbines, or the Saudi and Chilean customers.

The totality of the circumstances are reviewed when evaluating whether there has been a public use within the meaning of section 102(b). The totality of the

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circumstances is considered in conjunction with the policies underlying the public use bar. The circumstances may include: the nature of the activity that occurred in public; the public access to and knowledge of the public use; whether there was any confidentiality obligation imposed on persons who observed the use; whether persons other than the inventor performed the testing; the number of tests; the length of the test period in relation to tests of similar devices; and whether the inventor received payment for the testing. See *Allied Colloids*, 64 F.3d at 1574, 35 USPQ2d at 1842; *Baker Oil Tools, Inc. v. Geo Vann, Inc.*, 828 F.2d 1558, 1564, 4 USPQ2d 1210, 1214 (Fed. Cir. 1987); *In re Brigance*, 792 F.2d 1103, 1107-08, 229 USPQ 988, 991 (Fed. Cir. 1986); *Hycor Corp. v. Schlueter Co.*, 740 F.2d 1529, 1535, 222 USPQ 553, 557 (Fed. Cir. 1984); *TP Labs., Inc.*, 724 F.2d at 971-72, 220 USPQ at 582. There may be additional factors in a particular case relevant to the public nature of the use or any asserted experimental aspect.

In this case, the nature of the activity that occurred in public appears to be no different than the public use to which the prior art filters were put: Filtering of air admitted to turbines. There is no evidence that any of the customers believed they were under a confidentiality obligation imposed on the customers who observed the various uses. There is no evidence applicants made any discernable effort to inform the 1999 customers of any requirement of confidentiality, or otherwise indicate to them that they would owe them a duty of confidentiality. As noted above, the customers did not even know that a so-called experiment was underway. In this case, persons other

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than the inventors performed the testing. Finally, in this case the inventor received payment for the testing. All of these factors point to an ordinary commercial use rather than to an experimental use.

To establish that an otherwise public use does not run afoul of section 102(b), it must be shown that the activity was substantially for purposes of experiment. Applicants in their Crofoot Declaration and Supplemental Declaration presented no objective evidence to support experimental use. The experimental use negation is unavailable to a patentee when the evidence presented does not establish that he was conducting a bona fide experiment. *TP Labs., Inc.*, 724 F.2d at 969, 220 USPQ at 580. Furthermore, Applicants presented no objective evidence that they maintained any records of testing the filters. This failure weighs against them. *Allied Colloids*, 64 F.3d at 1576, 35 USPQ2d at 1844; *TP Labs., Inc.*, 724 F.2d at 972-73, 220 USPQ at 583) (recognizing that whether records were kept of progress may indicate that an inventor was testing the device, not the market).

Preparation of detailed records of the so-called "experimental" uses of the invention at the customer's plants is highly relevant for the keeping of detailed test records is a routine indicium of the experimental mode. As in *TP Labs.*, such facts "indicate the inventor was testing the device, not the market." 724 F.2d at 973, 220 USPQ at 583. In this case, there is no evidence whatsoever of any records of the performance of the filters in the customers' plants.

Applicants do not even argue that at all relevant times they took affirmative steps to maintain control of the invention. Here, Crofoot contends that applicants were alerted to the return of some filters, but there is no evidence that applicants required the customers to return the spent filters for forensic examination of their condition, nor did applicants indicate that the customers were required or even requested to provide feedback on the performance of the "new" filters. While there is some evidence that the customers closely monitored the performance of the filters, there was no indication that applicants inquired of those results, or required that data of their customers. As in Netscape Communications Corp. v. Konrad, 63 USPQ2d 1580 (Fed. Cir. 2002), applicants sold the filters "and let people try it out." There is no indication that applicants ever monitored the operating parameters of the turbine systems in which the new filters were used.

The law recognizes an inventor's need to test the invention, to ascertain whether the work is complete or further changes should be made, and to show that the invention will work for its intended purpose. . . . [S]uch testing and development may encompass or even require disclosure to the public, without barring the inventor's access to the patent system. Furthermore, if testing had to be run in customer's plant, even subsequent commercial success does not convert the test activity into an invalidating public use. The dispositive consideration is whether *the inventor* was in fact testing the invention. It is not necessary that the machine should be put up and used only in the

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inventor's own shop or premises. He may have it put up and used in the premises of another, and the use may inure to the benefit of the owner of the establishment. But for such a use by a customer to qualify as an "experimental use," the use must be under the surveillance of the inventor, and for the purpose of enabling him to test the product, and to ascertain whether it will answer the purpose intended, and make such alterations and improvements as experience demonstrates to be necessary. In this case, there is no evidence that the use was under the surveillance of the inventor. In this case, there is no evidence that the use by the customers was for the purpose of enabling the inventors to test the product. In this case, there is no evidence that the various uses were designed to answer whether the product would satisfy the purpose intended.

Declarant Crofoot stated the problem in the prior art was deterioration of the fine fibers made of the "old polymer" under combined conditions of high temperature (>25 °C) and high relative humidity (>70% relative humidity). However the locations selected to conduct the testing do not satisfy this requirement. Namely, the locations selected to conduct the testing are not hot and humid. Since the shipments were made in May, it can be assumed that the filters were installed during the months of June through August, as one would expect the filters to be installed within three months of shipment. While Saudi Arabia is hot during these months, it is not humid, as evidenced by the fact that a vast majority of Saudi Arabia is desert. Similarly, Santiago, Chile is not hot in the months of June through August as this is the winter season in the Southern Hemisphere.

Applicants' failure to monitor the use of the new filters and failure to impose confidentiality agreements on those that used it was enough to place the claimed features of the patent applications in the public's possession.

The on-sale bar applies when the invention is the subject of a commercial offer for sale, and is ready for patenting before the critical date. Pfaff v. Wells Electronics, Inc., 525 U.S. 55, 48 USPQ2d 1641 (1998). The ready for patenting condition "may be satisfied in at least two ways: by proof of reduction to practice before the critical date; or by proof that prior to the critical date the inventor had prepared drawings or other descriptions of the invention that were sufficiently specific to enable a person skilled in the art to practice the invention." *Id.* at 67-68. In this case, there is evidence that the claimed invention, or an obvious variation thereof, was reduced to practice because the new filters including the new polymer were manufactured and shipped to customers in the spring of 1999.

When the asserted basis of rejection is the on-sale bar, the examiner should determine whether the subject of the barring activity met each of the limitations of the claim. The various shipments of the filters in the spring of 1999 made in response to the various purchase orders from the various customers placed with the assignee of the invention clearly evidence "sales" of the filters made with the "new polymer" before the critical date of 05 September 1999. These sales were not incidental to an otherwise

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experimental use, so they evidence that the filters were "on-sale" within the meaning of §102(b).

The purchase orders submitted by the customers, i.e., Solar Turbines, GE Belle River, GE Elwood, the Saudi Arabia facility, and the Santiago, Chile facility were offers to buy the P19-1280 and P19-1281 filters. The purchase orders presumably contained sufficiently definite terms to create an enforceable contract upon acceptance under the UCC. It is unclear if they identified the requested product by specifically referring to the P19-1280 and P19-1281 product numbers. Be that as it may, the fact is that the assignees shipped the P19-1280 and P19-1281 products including the "new polymer" in response to these purchase orders. Filling of the orders with shipped product evidences a sale.

The absence of payment supports the inference that the tests were for the benefit of the applicant, and thus contravenes the inference of public use for or by the potential customer. However, unlike the Applied Colloids case, Assignee received payment from the customers for the filters shipped.

With regard to claim 1, the P19-1280 and P19-1281 filters, as in public use and offered for sell prior to the critical date of 05 September 1999, comprise a filter element comprising a media pack comprising a construction of a media composite (1), said construction including a substrate having a plurality of pleats having a length extending

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from said first end to said second end, the substrate comprising a filter medium having a high efficiency when tested with particles having a diameter of 0.01 to 1 μm , said construction having a tubular shape and defining an open interior having a first and a second opposite ends, said substrate at least partially covered by a single layer, said layer comprising a polymeric fine fiber comprising a fiber with a diameter of about 0.01 to 0.5 microns, a first end cap and a second end cap, said media pack being secured to said first end cap at said first end of said media pack, said media pack being secured to said second end cap at said second end of said media pack, at least one of said first and second end caps including a sealing portion, said sealing portion comprising a material compressible in a direction toward said media pack. See Crofoot Declaration at paragraphs 4, 5, 12, and 13.

While the fine fiber layers of the P19-1280 and P19-1281 filters are not explicitly disclosed as retaining greater than 30 percent of the fiber unchanged for filtration purposes after test exposure for a test period of 16 hours to test conditions of 140 °F and a relative humidity of 100 percent, the fine fiber material would have inherently possessed these heat and humidity resistance properties. As disclosed in the Supplemental Crofoot Declaration at paragraph 4, the fibers used to form the fine fiber layers were developed to solve the problem of deterioration of the prior art fine fiber layer under the conditions of high heat and high humidity. Since the fibers used to form the fine fiber layer were explicitly developed to provide heat and humidity resistance, they would have inherently retained greater than 30 percent of the fiber unchanged for

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filtration purposes after test exposure for a test period of 16 hours to test conditions of 140 °F and a relative humidity of 100 percent.

With regard to claim 2, the P19-1280 and P19-1281 filters comprise a polymeric fine fiber layer wherein the polymer comprises the condensation polymers nylon 6, nylon 66, and nylon 6.10. See Crofoot Declaration at paragraphs 5 and 13.

With regard to claim 20, the P19-1280 and P19-1281 filters comprise a polymeric fine fiber layer wherein the polymer comprises a nylon polymer comprising a homopolymer having repeating units derived from a cyclic lactam (nylon 6). See Crofoot Declaration at paragraphs 5 and 13.

With regard to claim 48, the sealing portion of the P19-1280 and P19-1281 is an axially directed seal. See Crofoot Declaration at paragraphs 4 and 12.

Claim Rejections - 35 USC § 103

21. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

22. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the public use and sale of the invention in view of Kahlbaugh et al. '399.

With regard to claims 3-7, the fine fibers of the P19-1280 and P19-1281 filters do not comprise addition polymers.

Kahlbaugh et al. discloses a similar filter having polymeric fine fiber layers, the fine fiber comprising the addition polymers polyvinyl chloride, polyvinylidene fluoride, and polyvinylidene chloride in col. 16, lines 53-64.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the fine fibers of the P19-1280 and P19-1281 filters using the addition polymers of Kahlbaugh et al. '399 in that such are merely an alternate materials in the art for forming a layer of fine fibers, mere substitution of one known fine fiber forming material for another in the art without a showing of unobvious or unexpected results being within the scope of one having ordinary skill in the art.

23. Claims 8 and 37 and rejected under 35 U.S.C. 103(a) as being unpatentable over the public use and sale of the invention in view of Emig et al.

With regard to claim 8, the fine fibers of the P19-1280 and P19-1281 filters do not comprise polyvinyl alcohol.

Emig et al. discloses a similar filter media having a layer of fine fiber supported on a substrate wherein the fine fiber comprises polyvinyl alcohol in col. 2, lines 26-53.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the fine fibers of the P19-1280 and P19-1281 filters using

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the polyvinyl alcohol or copolymer of vinyl alcohol of Emig et al. in that such are merely alternate materials in the art for forming a layer of fine fibers, mere substitution of one known fine fiber forming material for another in the art without a showing of unobvious or unexpected results being within the scope of one having ordinary skill in the art.

With regard to claim 37, the fine fibers of the P19-1280 and P19-1281 filters do not comprise a blend of a polyurethane polymer and a polyamide polymer.

Emig et al. discloses a similar filter media having a layer of fine fiber supported on a substrate wherein the fine fiber comprises a blend of a polyurethane polymer and a polyamide polymer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the fine fibers of the P19-1280 and P19-1281 filters using the blend of polyurethane and polyamide of Emig et al. in that such are alternate polymers in the art for forming fine fibers, mere substitution of one known fine fiber forming polymer for another in the art being within the scope of one having ordinary skill in the art.

24. Claims 48-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Engel '992 in view of the public use and sale of the invention.

With regard to claim 48, Engel '992 discloses a filter element (21) comprising a media pack (25) comprising a construction of a media composite, said construction

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including a substrate (30) having a plurality of pleats having a length extending from said first end to said second end, the substrate comprising a filter medium having a high efficiency when tested with particles having a diameter of 0.01 to 1 μm , said construction having a tubular shape and defining an open interior having a first and a second opposite ends, a first end cap (23) and a second end cap (24), said media pack being secured to said first end cap at said first end of said media pack, said media pack being secured to said second end cap at said second end of said media pack, at least one of said first and second end caps including a sealing portion (40), said sealing portion comprising a material compressible in a direction toward said media pack, wherein the seal is an axially directed seal in Figs. 1-4 and col.3, line 7 to col. 5, line 60.

Engel '992 does not disclose the substrate being at least partially covered by a layer, said layer comprising a polymeric fine fiber comprising a fiber with a diameter of about 0.01 to 0.5 microns such that after test exposure for a test period of 16 hours to test conditions of 140 $^{\circ}\text{F}$ air and a relative humidity of 100% retains greater than 30% of the fiber unchanged for filtration purposes.

The P19-1280 and P19-1281 filters, as in public use and offered for sell prior to the critical date of 05 September 1999, comprise a filter element comprising a media pack comprising a construction of a media composite (1), said construction including a substrate having a plurality of pleats having a length extending from said first end to said second end, the substrate comprising a filter medium having a high efficiency when tested with particles having a diameter of 0.01 to 1 μm , said construction having

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a tubular shape and defining an open interior having a first and a second opposite ends, said substrate at least partially covered by a single layer, said layer comprising a polymeric fine fiber comprising a fiber with a diameter of about 0.01 to 0.5 microns, a first end cap and a second end cap, said media pack being secured to said first end cap at said first end of said media pack, said media pack being secured to said second end cap at said second end of said media pack, at least one of said first and second end caps including a sealing portion, said sealing portion comprising a material compressible in a direction toward said media pack. See Crofoot Declaration at paragraphs 4, 5, 12, and 13.

While the fine fiber layers of the P19-1280 and P19-1281 filters are not explicitly disclosed as retaining greater than 30 percent of the fiber unchanged for filtration purposes after test exposure for a test period of 16 hours to test conditions of 140 °F and a relative humidity of 100 percent, the fine fiber material would have inherently possessed these heat and humidity resistance properties. As disclosed in the Supplemental Crofoot Declaration at paragraph 4, the fibers used to form the fine fiber layers were developed to solve the problem of deterioration of the prior art fine fiber layer under the conditions of high heat and high humidity. Since the fibers used to form the fine fiber layer were explicitly developed to provide heat and humidity resistance, they would have inherently retained greater than 30 percent of the fiber unchanged for filtration purposes after test exposure for a test period of 16 hours to test conditions of 140 °F and a relative humidity of 100 percent.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the filter media of the P19-1280 and P19-1281 filters into the filter element of Engel '992 to provide a filter element having a fine fiber filter media capable of being used in harsh environments.

With regard to claim 49, Engel '992 discloses the seal being a radially directed seal (40) in Fig. 4 and col. 5, lines 30-60.

With regard to claim 50, Engel '992 discloses the filter element further including an inner support liner (26) extending between the first and second end caps, said inner support liner being between said sealing portion and said media pack in Fig. 4 and col. 5, lines 19-23.

With regard to claims 51, Engel '992 discloses the second end cap (24) including an outer radial surface (75), said sealing portion comprising said outer radial surface in Fig. 5 and col. 6, line 60 to col. 7, line 15.

With regard to claim 52, Engel '992 discloses the filter element further including an inner support liner (26) extending between the first and second end caps and an outer support liner (27) extending between the first and second end caps in Fig. 4 and col. 5, lines 19-23.

Engel '992 does not disclose each of said plurality of pleats having a pleat length of at least 6 inches and a pleat depth of at least 1 inch.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the pleat length to be at least 6 inches and the pleat depth to be at least 1 inch to provide a filter element having a specific pleat arrangement for an intended application.

25. Claims 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over the public use and sale of the invention in view of Engel '992.

The P19-1280 and P19-1281 filters comprise an inner support liner extending between the first and second end caps and an outer support liner extending between the first and second end caps. See Crofoot Declaration at paragraphs 4 and 12.

The P19-1280 and P19-1281 filters do not have a radially directed seal, the inner support liner is not between said sealing portion and said media pack, and each of said plurality of pleats does not have a pleat length of at least 6 inches and a pleat depth of at least 1 inch.

Engel '992 discloses a similar filter element wherein the filters have a radially directed seal (40,75), the inner support liner is between said sealing portion and said media pack in Figs. 4 and 5, col. 5, lines 19-60, and col. 6, line 60 to col. 7, line 15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the end cap arrangements of Engel '992 for the end

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cap arrangements of P19-1280 and P19-1281 filters in that such are alternate end caps in the art for supporting and sealing a filter media within a filter housing, mere substitution of one known end cap arrangement for another in the art being within the scope of one having ordinary skill in the art.

Allowable Subject Matter

26. Claims 53, 81, 111, 128, 132, and 146 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action. Likewise, claims 54-80, 82-65, 68-110, 112-127, 129-131, 133-138, 140-145, and 147-149 would also be allowable if claims 53, 81, 111, 128, 132, and 146 were rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

27. Claims 9-19, 21-36, 38-47, 66, and 67 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

28. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 9-13, the prior art made of record does not teach or fairly suggest the filter element of claim 1 wherein the fine fiber is formed from crosslinked polyvinylalcohol.

With regard to claims 14, 27-36, 38-47, 66, and 67, the prior art made of record does not teach or fairly suggest the filter element of claim 2 wherein the polymeric fine fiber comprises a condensation polymer, other than a copolymer formed from a cyclic lactam and a C₆₋₁₀ diamine monomer or a C₆₋₁₀ diacid monomer, and a resinous additive comprising an oligomer having a molecular weight of about 500 to 3000 and an aromatic character wherein the additive is miscible in the condensation polymer but forms a hydrophobic coating on the fiber.

With regard to claim 15, the prior art made of record does not teach or fairly suggest the filter element of claim 2 wherein the polymeric fine fiber comprises a condensation polymer, other than a copolymer formed from a cyclic lactam and a C₆₋₁₀ diamine monomer or a C₆₋₁₀ diacid monomer, and a resinous additive comprising an oligomer having a molecular weight of about 500 to 3000 and an alkyl phenolic aromatic character wherein the additive is miscible in the condensation polymer but forms a hydrophobic coating on the fiber.

With regard to claims 16 and 21-26, the prior art made of record does not teach or fairly suggest the filter element of claim 2 wherein the condensation polymer

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comprises a nylon polymer, and a resinous additive comprising an oligomer having a molecular weight of about 500 to 3000 and an aromatic character wherein the additive is miscible in the condensation polymer but forms a hydrophobic coating on the fiber.

With regard to claims 17-19, the prior art made of record does not teach or fairly suggest the filter element of claim 2 wherein the condensation polymer comprises a polyalkylene terephthalate.

Conclusion

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (703) 308-6240. The examiner can normally be reached on Tuesday - Friday (7:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

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Jason M. Greene
Examiner
Art Unit 1724



jmg
May 22, 2003

DUANE SMITH
PRIMARY EXAMINER

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